

REFERENCE 4-C

Guidelines for preparing a landscape management plan

Landscape management plans have the potential to significantly reduce the pollutant load washing off managed green spaces. For this reason, landscape management plans that incorporate key pollution prevention elements and which are consistently implemented can be used in lieu of water quality treatment facilities (see Section 1.2.8). Submittal requirements for obtaining an approved landscape management plan are given in Chapter 2.

GENERAL CONSIDERATIONS

Studies of pollutant transport have consistently shown that forested lands consistently produce lower pollutant loads—of solids, phosphorus and metals—than do lands used for residential, industrial or agricultural purposes. “Loading” refers to the total weight of a pollutant leaving a particular area or site. It is measured by determining both the concentration of a pollutant and the amount of flow leaving a site. Since the Puget Sound area was largely forested before settlement, lakes and streams in the area have developed biotic regimes in response to this low pollutant loading—clear, cool waters supporting salmon and other aquatic life. When the input of pollutants increases, lakes and streams often shift to a more biologically productive mode, often with a concomitant loss of clear water and a shift or even a decline in fish species.

When forests are converted to cities, this increase in pollutant load needs to be managed in order to maintain the beneficial uses of lakes and streams. One way to manage pollutants is to treat stormwater before it enters a water body. Biofiltration swales, wetponds and sand filters, as well as other facilities, can be used to provide this treatment. Another approach to manage pollutant loads is to prevent the pollutants from entering stormwater in the first place.

Our best models on how to keep nutrients and pollutants from entering storm water are from the original, unaltered landscape—the forests. Forests have a soft, absorptive **duff** layer, as well as **dense vegetative cover**, especially near the ground surface. Nutrients are provided in the form of **slow-release** organic materials, or leaves, needles and woody material. Rainfall **runoff is greatly reduced** from the levels seen in developed landscapes. These factors help to keep the total load of nutrients and sediments transported to receiving waters low.

ELEMENTS OF A SUCCESSFUL LANDSCAPE MANAGEMENT PLAN

Good planning, tailored to the specific conditions of the site, as well as good follow-through, are both essential in controlling the pollutants generated when forests are replaced with lawns, gardens or other landscape features. This section will focus on planning. Follow-through, or implementation, will be discussed in the next section.

I. Plan contents

A landscape management plan for any particular site works best if developed with the specific site characteristics in mind. Soil type, slope, exposure, depth to groundwater as well as the particular suite of plants chosen for the site all should help direct the specific make-up of the plan. However, there are some basic principles that all sites should consider in order to be successful in controlling the export of soil or organic matter, fertilizers and pesticides in stormwater runoff. Landscape management plans should address each of the general principles given in Table 1, tailoring them to fit the specific site situation.

Each of the five basic principles is expanded upon in the following section. The recommendations discussed under each principle are intended as a framework for a variety of site situations, from individual homes to large parks and golf courses. Thus, not every landscape management plan may be able to apply each of the listed recommendations. In addition, landscapes are managed for different purposes, some more formal than others. It may be that some recommendations will not be appropriate for very formal sites and thus not adopted, in favor of other management practices that better fit the uses for which the site is intended. In the end, the extent to which a landscape management plan is successful depends on the ability of the practices chosen to retain soil, fertilizers and pesticides on the site and away from water resources throughout the entire year.

Table 1 Basic principles to reduce pollutant transport from landscaped areas

1	Minimize bare soil areas
2	Reduce water demand
3	Reduce extent of turf area—manage remaining turf for low-impact
4	Choose plants with sustainability in mind
5	Manage fertilizer and pesticide use wisely

Principle 1 Minimize bare soil areas

Bare soil areas are one source of solids that can be mobilized and carried downstream by rainfall. Minimizing bare soil areas makes it less likely that solid particles will be dislodged by rainfall. Some pointers on how to manage landscapes to minimize bare soil are given below.

- a) Establish dense plantings of pest-resistant groundcover to shade out weeds. Some easy-care recommendations are rock rose (*Cistus* sp.), snowberry (*Symphoricarpus alba*), salal (*Gaultheria shallon*) and kinnickinick (*Arctostaphylos uva-ursi*).
- b) If bare soil areas are required, as in plant beds or ball diamonds, surround the bare area with an area of grass or groundcover to filter out solids that may be picked up by stormwater runoff.
 - The denser the grass or groundcover, the better it works to capture solids in runoff.
 - Try to make the filtering area as level as possible. Avoid low spots, where runoff can concentrate and create channels.
 - In general, filter areas should be about one-fourth as long (along the flow path) as the area contributing flow, assuming that slopes are gentle (less than about 10 percent). For flat, level areas without dips, this length can be reduced.
- c) Repair promptly bare patches in lawns or groundcovers that could contribute solids to stormwater runoff.
- d) Don't place bark or loose mulch on slopes where it can be carried to stormdrains.

Principle 2 Reduce water demand

Reducing the need for irrigation reduces the potential movement of pollutants, conserves water and saves money.

- a) Use drought tolerant or native vegetation.
- b) Install underground irrigation systems timed to water at night or drip irrigation systems.
- c) Increase the organic content of soils to improve water-retention capability.
- d) Allow for longer water retention by terracing sloped areas.

Principle 3 Reduce turf area and manage remaining turf for low-impact

Turf requires care to look good. In addition to mowing, turf areas typically require water, fertilizer and weed and disease control. However, some practices can reduce or minimize the amount of chemical controls needed.

- a) Amend soil with organic matter to a depth of 8 -12 inches before the lawn is established. Till the organic matter into the native soil.
- b) Decide if all lawn area needs the same level of upkeep: let some areas have a less formal look if possible, and reduce fertilizer and pesticide use in those areas.

- c) Rely on irrigation and lawn aeration as the primary tools to maintain healthy turf.
- d) Remove thatch each year to increase water penetration to grass roots and reduce runoff.
- e) Plant groundcovers rather than grass in shady areas. Turf grasses usually need at least partial sun to remain vigorous.

Principle 4 Choose plants with sustainability in mind

Plants differ in their ability to cope with different soils, rainfall conditions, pest and diseases and microclimates. Choosing resilient plant species, plants with adaptations for particular environments or creating optimal microenvironments are all techniques that can be used to create landscapes that require less intervention. Less watering and less need for pesticide and fertilizer application means less potential for pollutants to leave the site.

- a) Choose disease resistant plants.
- b) Choose drought-resistant groundcovers, shrubs and trees in areas with poor soil or little shading.
- c) Group plants in clusters with tree, shrub and groundcover layers to create a better micro-environment and to supply organic matter back to the soil.
- d) Include plants in the landscape that are important for beneficial insects such as parasitic wasps. If beneficial insects have nothing to sustain them, they won't stick around to control pests when you need them.
- e) Use dense plantings or close spacing to shade out weeds rather than herbicides.
- f) Use plants with fibrous roots on steeper slopes or erosion-prone areas.¹ Some good choices include:
 - *New Zealand flax (*Phormium tenax*)
 - Ornamental grasses, lawn grasses
 - *Rock rose (*Cistus* sp.)
 - Rosa rugosa
 - Salmonberry (*Rubus spectabilis*) -- native
 - Snowberry (*Symphoricarpos alba*)-- native* not hardy in all areas of the County
- a) Use wetland plants in areas with seeps or a high water table.
- b) Attend to installation details. Write enforceable planting specifications that include details such as soil preparation, plant spacing, plant condition and size, planting depth, transplant handling and irrigation. Inspect the job during planting to prevent short cuts such as blowing the soil mixture around root balls rather than digging the roots into amended native soils.

Principle 5 Manage fertilizer and pesticide use wisely

Many landscape plants and turf simply won't do well without fertilization and some amount of pest management. It's therefore important for landscape management plans to address when and how these actions will be taken.

- a) Keep plants healthy by building healthy soil using composted organic material. Healthy plants can better resist diseases and insect pests.
- b) Tailor fertilizer make-up to lawn needs. Adjust application rate and timing of fertilizer applications to avoid carry-off in storm runoff.
- c) Reduce the phosphorus (P) concentration in fertilizers when possible by using a low phosphorous formulation or formulations containing only nitrogen or potassium. Added phosphorus is often not needed for health foliage growth, only for encouraging profuse blooms.
- d) Use an integrated pest management approach to control pests. Keep current about non-chemical controls as a first-defense against pests.

¹ Note that the County's Sensitive Areas Code (21a) defines and protects steep slopes and landslide hazard areas from encroachment. Generally, clearing of vegetation is prohibited in areas with slopes of 40% or more.

- e) Encourage a diverse insect community in your landscape: Beneficial insects can help control pests, especially pests of trees and shrubs.
- f) Target pesticide application to the specific pest of concern. Avoid pesticide “mixes” targeting generic problems (such as weed and feed) unless you actually need each of the formulations for a current problem.
- g) Only apply pesticides during the life-stage when the pest is vulnerable.
- h) Use fungicides very sparingly—they disrupt the base of aquatic food webs. If you need to use fungicides, spray formulations with faster break-down times. Consult a golf course management text for information on the attributes of various fungicides (and other pesticides). Balough and Walker, 1992, *Golf course management and construction* by Lewis Publishers is one source of information.
- i) Tolerate some weeds.

References

“Weed management for lawns and gardens.” Washington Toxics Coalition Fact Sheet, 1989.

“Least toxic lawn management.” The BioIntegral Resource Center (BIRC), P.O. Box 7414, Berkeley, CA 94707

Washington State Cooperative Extension publications on lawn care, Bulletin Office, Cooperative Extension, Cooper Publication Building, Washington State University, Pullman, WA 99164-5912

Selected titles include: “Turf grass diseases” and supplement (EB0713 and EB0713S); “European crane fly” (EB0856); “Fertilizer guide: western Washington” (FG0041); “Disease control in home lawns” (EB0938); “Home lawns” (EB0482).

II Plan implementation

A landscape management plan, no matter how good, will not reduce pollutants in runoff if it is not implemented. And implementation often means that the plan needs to be modified over time, since as plants grow and as the cycle of pests change, the original plan may not fit the site. The following must be addressed before a landscape management plan can be approved.

1. Identify who will be responsible for assuring the management plan is carried out.
2. Identify how the applicant will assure that grounds crews or homeowners have the training and/or resources required to implement the plan and keep up to date on advances in landscape care practices and products.
3. Agree to keep records of fertilizer and pesticide application, including rate of application, area treated and disposal or storage of residue.
4. Agree to certify each year that the landscape management plan for the project in question has been carried out, and that needed amendments or updates have been made.
5. Provide the plan to County maintenance or inspection personnel on request
6. Agree to pay an annual fee (based on time expended) to allow the County to administer the certification process, including review of plans, tracking of information, periodic field inspections and sampling.